

Before the  
Federal Communications Commission  
Washington, D.C. 20554

In the Matter of )  
 )  
Inquiry Regarding Carrier Current Systems ) ET Docket No. 03-104  
Including Broadband over Power Line )  
Systems )

### COMMENTS OF HAWAIIAN ELECTRIC COMPANY, INC.

Pursuant to Section 1.415 of the Federal Communications Commission ("FCC") Rules, Hawaiian Electric Company, Inc. (HECO) hereby submits comments in response to the *Notice of Inquiry* in the above referenced proceeds. HECO, as a member of the United Telecommunications Council's United Power Line Communications (UPLC)<sup>1</sup> organization, applauds the FCC for initiating this NOI and provides the following information in support of Broadband over Power Line (BPL)<sup>2</sup> technology deployment by utility companies.

HECO<sup>3</sup> has been evaluating BPL since 2000, when it jointly performed access and in-home characterization analysis in multiple and single-dwelling residential homes with Intellon Corporation.<sup>4</sup> HECO's initial characterization results demonstrated that power line medium was a feasible media for both access and in-home high-speed data telecommunications. As such, HECO continued to evaluate BPL vendors, primarily conducting white paper analysis until mid-2002. Subsequently HECO commenced live beta testing of at least two vendors' technologies.

#### BPL Enables Cost-Effective Enhanced Utility Customer Service and Operations

HECO's interest in BPL is primarily enhanced utility operations, with secondary interest in the potential for added services and related incremental revenue gains for the benefit of ratepayers and shareholders.

<sup>1</sup> UPLC - United Power Line Communications Council is a sub-organization within the United Telecommunications Council (UTC) organization.

<sup>2</sup> Previously commonly referred to as Power Line Communications (PLC).

<sup>3</sup> Hawaiian Electric Company, Inc. (HECO) is a subsidiary of Hawaiian Electric Industries, Inc., (HEI) and is a State of Hawaii Public Utilities Commission regulated franchise serving approximately 405,000 customer accounts and 1,150,000 served residents state-wide.

<sup>4</sup> Intellon went on to be selected as the chip technology vendor for the HomePlug™ 1.0 standard using power line OFDM protocol. HECO is a past member of the HomePlug™ Alliance.

The enhanced utility operation functions occur as a result of access BPL—the presence of BPL signals on the utility medium voltage distribution network. Most significantly, the BPL injection/repeater devices will have the capability of detecting signal patterns that occur prior to breakdown of electrical grid elements, such as faulty conductors, low voltage transformers, capacitors, fuse devices, etc. As these BPL detection technologies develop and mature, the BPL bandwidth availability can presently be used to extend traditional utility SCADA (Status, Control And Data Acquisition) throughout the utility power grid. Such a deployment would improve customer service and system reliability and minimize, if not eliminate, customer reliance for outage notification. Existing low-speed power line communication (low speed PLC) technologies do not afford these capabilities. Thus, predictive failure analysis and the potential physical “reach” of BPL are side benefits of BPL deployment that could lead to reliability and service improvements to utility customers. There are numerous other enhanced utility functions<sup>5</sup> that HECO included in its technical analysis.

At the BPL in-home level, HECO identified a number of enhanced customer service applications<sup>6</sup> that heretofore have not been economically viable. These, coupled with the enhanced utility operations applications, provide a strong business case for deploying BPL for utility needs. The utility uses generally only consume small bandwidth, leaving a significant bandwidth available for consumer level broadband applications, such as Internet service or Voice Over Internet Protocol (VoIP) telephony. The latter services further bolster HECO’s prospective BPL business case.

HECO believes the combination of utility applications and potential to provide consumer Internet/Voice services is in the best interests of its ratepayers and corporate shareholders. No other technology is available that leverages existing assets (utility distribution facilities) and provides enormous potential for economical customer connectivity.

BPL provides a potential communications infrastructure that promises to be lower cost than other alternatives for serving our customers, for applications such as advanced customer metering, direct load management, and demand response programs. From an operations perspective, BPL’s high speed capacities will allow HECO to improve its infrastructure security, better ensure public safety, and provide more timely responses to customer outages. This is increasingly important due to classification by the United States government of specific public and private infrastructure assets, such as electric utility assets, under MEVA<sup>7</sup> guidelines. Under MEVA, HECO is responsible to ensure secure

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<sup>5</sup> Enhanced utility applications include: communications for distribution automation, distributed generation, distribution data acquisition, disaster recovery, system protection, and diagnostic monitoring.

<sup>6</sup> In-home BPL enhanced customer service applications may include load control/demand response, Time-of-Use rates, load profiling, outage detection, meter theft monitoring, and remote start/stop.

<sup>7</sup> MEVA - Mission Essential Voluntary Assets established by Presidential order as part of the Homeland Security policies framework.

infrastructure power for federal facilities, including military bases, and state, city, and local government. BPL is envisioned as a boon to economically expand the utility communications infrastructure, enabling applications such as electric facilities' video surveillance to ensure security and public safety.

#### BPL Promotes Facilities-based Competition

HECO believes BPL will benefit its served communities by providing another facilities-based medium for last-mile customer connectivity for a variety of high-speed communications services. Although some utilities subscribe to direct broadband competition models, usually through telecommunications subsidiaries, HECO subscribes to a "landlord"<sup>8</sup> model. HECO's preference is for an *open access* model, wherein another content provider/services company will lease the BPL infrastructure to provision broadband services, while still permitting modest utility uses. The open access model affords Internet Service Providers (ISPs) and Competitive Local Exchange Carriers (CLECs) that do not have last mile facilities, as well as the Local Exchange Carrier (LEC) and cable company, to use the access facilities for specific needs. In the latter case, for example, the LEC may have areas where DSL service is infeasible, and in those areas BPL may offer a platform for economical DSL-equivalent service. Likewise, the cable company may have commercial buildings where secure conduit space is inaccessible, but where BPL could provide instant-wired connectivity. In summary, BPL is an access medium that has unique qualities that may be attractive to diverse broadband competitors to expand competitive breadth.

From a cost perspective, HECO estimates that by leveraging existing wired utility assets, BPL potentially offers a lower cost medium that may enable tiered Internet services at price points that dial-up customers will find attractive. Also, with expanded utility uses, such as advanced metering, BPL may provide expand services and links to customers that are currently not attractive or economical for existing broadband services providers. Essentially, every electrical outlet could become part of a home-based, symmetrical internet network, with no new wiring or re-wiring.

#### BPL Interference is a Low Risk

HECO believes that BPL does not pose significant risks for unintended high frequency radiations that will interfere with consumer devices, amateur radio operators, or other forms of commercial communications (television, radio, mobile radio, etc.). This belief is held for several reasons, described as follows:

- *Equipment Vendors will FCC-certify their access and in-home BPL technologies.* For example, our second BPL trial vendors has completed

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<sup>8</sup> Landlord model (or, alternatively, lease model), where the broadband service provider may establish an agreement with the utility for remuneration for facilities attachments and usage fees, in addition to co-funding some capital investments.

its extensive FCC compliance certification and in turn can now affix the FCC stickers on the access BPL equipment that we are currently beta trialing. Vendors also design their implementation based on meeting existing FCC radiated emissions compliance requirements.

- *Consumer products are FCC Part 15 certified.* The BPL vendors that HECO has or presently is testing use FCC certified WiFi (802.11b) or HomePlug™ 1.0 compliant bridges, routers, and adapters from LinkSys, NetGear, and Siemens. Further demonstrating HomePlug's mainstream adoption, Time Warner Hawaii is also deploying NetGear HomePlug™ compliant bridges as an option for home networking in conjunction with Roadrunner broadband services.
- *Tests have not revealed any issues.* In HECO's first three-month BPL deployment, no public complaints were registered for access or in-home related interference. HECO's first BPL vendor invited a FCC-testing consultant to conduct interference tests at HECO's trial sites and no apparent issues surfaced as a result of those tests. HECO also conducted its own in-home testing with a number of consumer devices, such as household appliances, televisions, and radios, and did not observe any radiated emissions interference from BPL signals on the in-home wiring.
- *Extensive safety checks on overhead (aerial) and underground equipment.* HECO believes the access and in-home BPL technologies can be safely and reliably installed and operated. HECO has trained its crews to safely install BPL equipment used in its trials. HECO teams paid special attention to ongoing safety concerns, such as distribution line coupling, pole attachment clearances, powering options, appropriate fusing, etc. This experience supports HECO's view that BPL will reliably and safely operate on its distribution network. In addition, with UL-approved and FCC-certified CPE devices, HECO feels that safety and interference concerns are additionally being addressed. These devices are plug and play units, very similar to cable and DSL modems.

In summary, HECO believes that existing FCC Part 15 radiated compliance rules sufficiently govern both access and in-home BPL technologies. HECO also supports elimination of conducted limits, as radiated emissions are the true indications of interference potential.

### Conclusion

HECO, as a UPLC member, commends the FCC for its efforts with the subject NOI, and looks forward to an outcome that permits utilities to leverage their assets and provide a new broadband medium that will serve the public good, while further stimulating broadband competition.

HECO asserts that the existing FCC guidelines are sufficient and that the FCC's encouragement of utility investment and trial deployment, potentially leading to BPL commercialization, is appropriate and justified. The vendors in this

market understand the need for FCC-certifying their equipment before it can be commercially deployed. With these protections, interference issues can be mitigated to ensure that BPL access and in-home equipment operates within existing FCC guidelines.

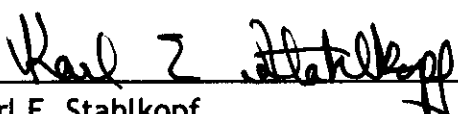
A "third wire" broadband medium, as highlighted in Chairman Powell's comments<sup>9</sup>, is in the public's best interest. For the utility, duality of use is attractive and will lead to benefits for its utility customers, for the public in general, and for potential service providers that can leverage the BPL infrastructure. Presently, the BPL opportunity is leading to increased OFDM<sup>10</sup> technology innovation, which will help the telecommunications industry and provide more options for broadband deployment worldwide.

BPL vendors have demonstrated sincere efforts to ensure that their technology, provisioned as an unintentional radiator, does not interfere with FCC-regulated radio bands and will indeed meet FCC Part 15 requirements. In addition, FCC Order 97-Section 157 essentially places the burden on BPL opponents to justify why a new entrant or technology that may provide more affordable telecommunications to a broader base of customers, should not be approved. HECO asserts that heretofore arguments voiced by amateur radio forums do not meet this burden, and remain unsubstantiated and speculative without direct evidence that BPL vendors' technologies cause interference in excess of approved limitations established by FCC guidelines.

HECO appreciates the opportunity to provide relevant comments on the BPL NOI.

Respectfully submitted,

Hawaiian Electric Company, Inc.

By:   
Karl E. Stahlkopf  
Sr. Vice President, Energy Solutions &  
Chief Technology Officer

Hawaiian Electric Company, Inc.  
P.O. Box 2750  
Honolulu, Hawaii 96840-0001

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<sup>9</sup> FCC Chairman Powell's separate statement in ET Docket 03-100, Page 17, April 28, 2003

<sup>10</sup> OFDM - Orthogonal Frequency Division Multiplexing